THE EFFICIENCY AND EFFECTIVENESS OF BUILDING MAINTENANCE FOR COLLEGE TUN HUSSEIN ONN (KTHO), UNIVERSITI TEKNOLOGI MALAYSIA

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Dedication…

To my beloved father and mother

&

To my beloved siblings

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ABSTRACT

Buildings are the most valuable assets in a nation, which providing people with shelter and facilities for work and leisure. A correspondingly strong building conservation movement has also directed attention towards the older built stock such as the education building or student residential building. Therefore, buildings will be long lasting when not only the right construction system and quality of materials are chosen but also the buildings which have right and accurate maintenance applied. Hence, the need of maintenance is very important and necessary for all of the sectors which include properties sectors. Student accommodation in Universities or Colleges is a crucial consideration as it become second home. The facilities in student accommodation building are much concentrated in term of student's facilities in order to provide a comfortable and healthy learning environment. The aim of this study was to assess the efficiency and the effectiveness of building maintenance for students residential College Tun Hussein Onn (KTHO), UTM. The data and information of building maintenance system of the student residential were analysed based on response, time taken to action and quality of repair by Pejabat Harta Bina (PHB) Universiti Teknologi Malaysia. The result of the study will assist the management to promote affective and improvement of building maintenance program is available in UTM. The study shows that the maintenance is important to prolong the life of buildings in UTM as increasing the level of comfort and to maintain the value of asset. The maintenance works that are undertaken by PHB were classified under emergency, urgent, normal and request. Besides, the level of respond to the maintenance and repair calls for buildings is averages as some aspect receive prompt attention while others services may take much longer time.

ABSTRAK

Di Asia Tenggara, Malaysia adalah salah satu negara pembangunan yang berkembang pesat dalam semua sektor, termasuk sektor pembinaan terutamanya sub-sektor perumahan. Oleh sebab itu, projek besar dan kompleks telah dibina kerana tuntutan baik dari sektor awam dan swasta. Sejalan membina gerakan pemuliharaan dan menyenggaraan yang tinggi juga telah mengarahkan perhatian terhadap bangunan yang lama dibina seperti bangunan pendidikan atau tempat tinggal pelajar di Malaysia. Pada masa kini, terdapat pelbagai sifat persekitaran atau elemen yang dihadapi supaya sukar mengadarkan tempoh ketahanan bangunan. Oleh kerana itu, bangunan akan tahan lama tidak hanya mengadakan sistem pembinaan yang tepat dan bahan pembinaan kualiti yang dipilih, tetapi bangunan sepatutnya mempunyai sistem penyenggaran dan ubahsuai yang tepat dilaksanakan. Namun, keperluan penyelenggaraan sangat penting dan diperlukan dalam semua bangunan. Kemudahan dan keperluan visual pelajar, kualiti persekitaran penginapan dan belajar yang sesuai amat ditimbang rasa kepada para pelajar. Penyenggaraan Bangunan di Universiti Teknologi Malaysia (UTM) berada di bawah tanggungjawab Pejabat harta Bina (PHB). Tujuan kajian ini adalah untuk melihat kecekapan dan keberkesanan penyelenggaraan penginapan kolej Tun Hussein Onn (KTHO), UTM. Data dan maklumat akan dianalisis berdasarkan kualiti ubahsuai dan waktu tindakan yang diambil oleh pihak PHB. Keputusan kajian akan membantu sistem pengurusan untuk peningkatan kecekapan dan keberkesanan program penyelenggaraan bangunan terdapat di UTM. Cadangan pembaikan yang difikirkan perlu bagi peningkatkan tahap perkhidmatan penyenggara dan pemeliharaan bangunan penginapan pelajar di UTM.

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BMP	-	Building Maintenance Program
BMS	-	Building Maintenance System
BS 3811	-	British Standard 3811
CIB	-	Agenda 21 of Sustainable Construction
E-CS	-	Electronic Customer Support
ISO	-	International Organization for Standardization
ITK	-	Institut TeknologiKebangsaan
KDSE	-	Kolej Datin Seri Endon
KP	-	Kolej Perdana
KRP	-	Kolej Rahman Putra
KTC	-	Kolej Tuanku Canselor
KTDI	-	Kolej Tun Dr. Ismail
KTF	-	Kolej Tun Fatimah
KTGB	-	Kolej Tun Gafar Baba
KTHO	-	Kolej Tun Hussein Onn
KTR	-	Kolej Tun Razak
PHB	-	Pejabat Harta Bina
SLK	-	"Sistem Laporan Kerosakan"
UTM	-	University of Technology Malaysia

CHAPTER 1

INTRODUCTION

1.1 Background of Study

An increasing of importance in building maintenance is shown by the growing awareness and it is inclusion as theme in several large national conferences on this subject, the mounting of postgraduate course in maintenance management, and the considerable volume of maintenance research by government departments, universities, apart from the valuable works undertaken by the leading professional bodies connected with the building industry. Most of the buildings are constructed with an improper intention that the buildings should be lasted at least 60 years or exceed the period. The lives of existing building are difficult to assess as all properties having nowadays (Seeley, 1967). Therefore, buildings will be long lasting when not only the right construction system and quality of materials are chosen but also the buildings have right and accurate maintenance applied. Hence, it can be described that building maintenance is important especially for the university building and infrastructures. Due to the high demand of both sectors' need, it is expected that many errors and defects will occurred during the design and

construction phase of the project, as a result the high cost of maintenance is unavoidable.

Bad conditions of the equipments may directly interfere not only in the organization economics, but also reduce the overall availability of buildings as well as interfere the occupants' security. This can be used as the reason to explain why both installation and equipments associated with the operation of university buildings must be maintained in good condition such as fixed equipment, building structure, safety, technology, facilities and maintenance must be considered in a well-balanced way (Ana & Marques Cardoso, 2006).

The growing realization that existing buildings represent sizeable economic resources that need to be managed and maintained in order to extend its usable life has led to greater attention being focused on maintenance and modernization activities (Quah, Lee Kiang, 1990). A correspondingly strong building conservation movement has also directed attention towards the older built stock such as the education building or student residential building. Therefore, the need of maintenance is very important all sectors including properties sectors, especially building.

According to Reginald Lee (1981), Building maintenance now account for over half the building industry's total output, and for over two thirds of the contracts amount. The change of social attitudes over these periods has resulted a greater emphasis on environmental management, health and safety, and user-oriented service provision. Building maintenance becomes a major activity in most of the developing countries and also big business in the industrial sector. The role which played by maintenance in the construction process can be initialed from design stage. The involvement of maintenance department in this stage is being an adviser for the designer to figure out the maintenance problems (Human, 2005).

Building maintenance is defined as "work undertaken in order to keep or restore or improve every part of building in term of its facilities, building content, service and surrounds, to an acceptable standard and to sustain the utility and value of the building" (Seeley, 1976). On the other hand, building maintenance can be defined as "a combination of any actions carried out to retain an item in or restore it to acceptable condition". (Paul Wordsworth, 2000). The actions referred to those associated with initiation, organization and implementation. These are two processes envisaged such as "retaining" which work is carried out in anticipation of failure while "restoring" is the work carried out after failure.

Regarding to BS 3811, maintenance subdivided into 'planned' and 'unplanned' maintenance, the former maintenance is divided into 'preventive' and 'corrective' maintenance. Planned preventive maintenance is a work to prevent the failure of the facility, carried out within the expected life of the facility to ensure its continued operation. Planned corrective maintenance is work performed to restore a facility to operation or to an acceptance standard. Otherwise, unplanned maintenance is work resulting from unforeseen breakdown or damage due to external causes.

A government Committee of Building Maintenance in British has described how this class of work is accorded either little or no merit. The morale of those involved in its management and execution will be suffered and the productivity will remain low while it remains a neglected backwater. It is highly desirable but hardly feasible to produce a building which is maintenance-free; it can reduce the amount of subsequent of maintenance work since do well in design stage (Paul Wordsworth, 2000). All elements of building deteriorate at a greater or lesser rate dependent on materials and methods of construction, environmental condition and the use of the building. The lives of existing buildings are difficult to assess as all properties have, from the date of their erection, been the subject of varying amounts and standards of maintenance, besides being constructed to different standards. According to case study of Committee of Building Maintenance (1976), most building is constructed

with the intention that they should last at least 60 years or exceed this period. Maintenance starts the day from completion of construction site. Design, materials, workmanship, function, use and their interrelationships, will determine the amount of maintenance required during the lifetime of the building.

Furthermore, Building Maintenance Program is focusing on the need for well structured and delivered maintenance attention to defined building Life Safety features. The Building Maintenance Program (BMP) is not limited to health care facilities but the BMP does not duplicate or replace other inspection, testing, and maintenance activities. Paul Wordsworth (2000) defines that the difference between maintenance planning and programming. Such as, planning embraces the whole process of maintenance management as detailed in the policy for maintenance and controlling the progress of work and budget expenditure of the building. However, programming relates to scheduling the manner in which maintenance works will be carried out day-to-day or breakdown maintenance of the building and minimise the new works. Maintenance program can considerably improve the ability to assess the effectiveness of future maintenance works and able to increase maintenance efficiency by targeting the trouble spots.

1.2 Problem Statement

There are several strategies in maintaining building options which are available to the management. As a result, there will be more alternative decisions. For example, the possibility of reducing the demand of maintenance by addressing the actual cause of failure and identifying its consequences. It may be necessary to

decide whether to repair or replace an item, and whether to carry out periodic maintenance at fixed intervals or simply to respond to the requests of the users.

The condition and quality of buildings is one of the most fundamental components of the quality of life. The vast majority of people spend over 95% of their time in or next to a building of one kind or another, in other words the built environment has became our natural environment. Such as, universities and colleges cover a broad range of human activity and habitation (Richard, 1992). The facilities in student accommodation building are much concentration in term of student's facilities and a comfortable healthy learning environment. For the most part of later works deal with the general problems of colleges and universities' architecture or the problems of sanitation, hygiene, safety from both disease and fire hazard, utilization, design and general structure (Arthur Marcus, 1972).

Hence, the building fabric has to satisfy different user's needs and occupational factors. From the building fabrics are in terms of weathertighness, noise reduction, durability, indoor comfortable, well facilities and visual requirements. Therefore, major repair usually involve the replacement and renewal of elements or components for the purpose of eliminating areas of high maintenance costs or restoring lost or diminished amenities. The rate of deterioration may be accelerated and major repairs precipitated by failure to take early remedial action such as to patch roof coverings or renew roof complete including ceiling plaster. Consequently, a new education building is not immune to deterioration due to the lack of proper maintenance. It is important that maintenance be conceived as an on-going activity designed to keep the educational function and environment conditions of learning building at its perfect efficiency.

Student accommodation is important as it has become their second home. Students spend most of their time in hostel and student residential is an important learning environment after their lectures. Therefore, the condition and quality of

buildings reflected the student's safety and health environment. In the student accommodation, there are several types of facilities and these facilities will affect the students in having their comfortable learning environment without the properly facility service and bad conditions of exterior and interior building. The request of maintenance works which often happened in student's accommodation are repairing and rehabilitation of external or internal cracked reinforced concrete walls and waterproofing, replacement of roof, painting, lighting system, light bulb maintenance, and water pile system.

The study of Human (2005) mentioned that the important role of the present maintenance management implemented in the student residential UTM. The development of students residential in UTM since 2002 has dramatically changes the capacity and facilities provided. Therefore, the differences in capacity and facilities would triggered a different building maintenance program requires the study to analyse whether the building maintenance management system of UTM can be implemented to the student residential building or vice versa. Maintenance program in UTM is under the responsibility of Pejabat Harta Bina (PHB). Currently, there are three units under PHB's control which are development, maintenance and contract administration. Presently they have three main units for development and maintenance building in the campus which are maintenance unit, project/construction unit, and contact administration unit. However, the maintenance unit has the responsibility for the maintenance building after handling over.

To see the effectiveness and efficiency of maintenance program in college, it is to asses that UTM has applied a proper building maintenance system especially for student residential. Nevertheless, the maintenance management program should be carried out in good order in the residential college by effectiveness Building Maintenance.

1.3 Aim and Objectives of Study

The aim of this study is to analyse the efficiency and the effectiveness of Building Maintenance implemented by Pejabat Harta Bina in managing maintenance work in UTM with special reference to College Tun Hussein Onn, Universiti Teknologi Malaysia (UTM).

The aim of the study may be achieved though the following objectives.

i. To study the importance of building maintenance management.

ii. To study the building maintenance management system of the student residential in UTM.

iii. To assess the efficiency and the effectiveness of Building Maintenance Program (BMP) for students residential college KTHO at UTM.

1.4 Scope of Study

Many studies were conducted on building maintenance in UTM. These studies were mostly in regards to the expenditure of the building maintenance and the factors of defects construction. Regarding to the Human (2005), maintenance at

Universiti Teknologi Malaysia is under the responsibility of Pejabat Harta Bina (PHB) UTM. He has identified that the new maintenance management implementation for the new student residential at UTM. During the preliminary stage of interview from Principal of Colleges Tun Hussein Onn, he mentions that maintenance work in particular student residential college is less efficient and effective. He suggests that the effectiveness of building maintenance system may due to lack of motivation to work or the budget for the maintenance.

Thus, the research will assess the Building Maintenance executed in student residential College Tun Hussein Onn (KTHO), UTM. This study will be focusing on the building defects report in KTHO during June of 2009 until May of 2010. Nevertheless, a standard guideline of PHB in relation to maintenance is used to benchmark the effectiveness of maintenance work carried out.

1.5 Significant of Study

(i) To improve the level of respond to maintenance since the system of "Sistem Laporan Kerosakan (SLK)" was applied in UTM.

(ii) The result of the study will assist the management to provide an effective of building maintenance system in UTM as some of the maintenance works were taken much longer time to act.

(iii) The suitable recommendation of the building maintenance system is expected to improve the level of building maintenance management in Universiti Teknologi Malaysia.

1.6 Research Methodology

In order to achieve the aim and objective of this study, the approaches being taken towards the collection of the data and information are based on the following steps:

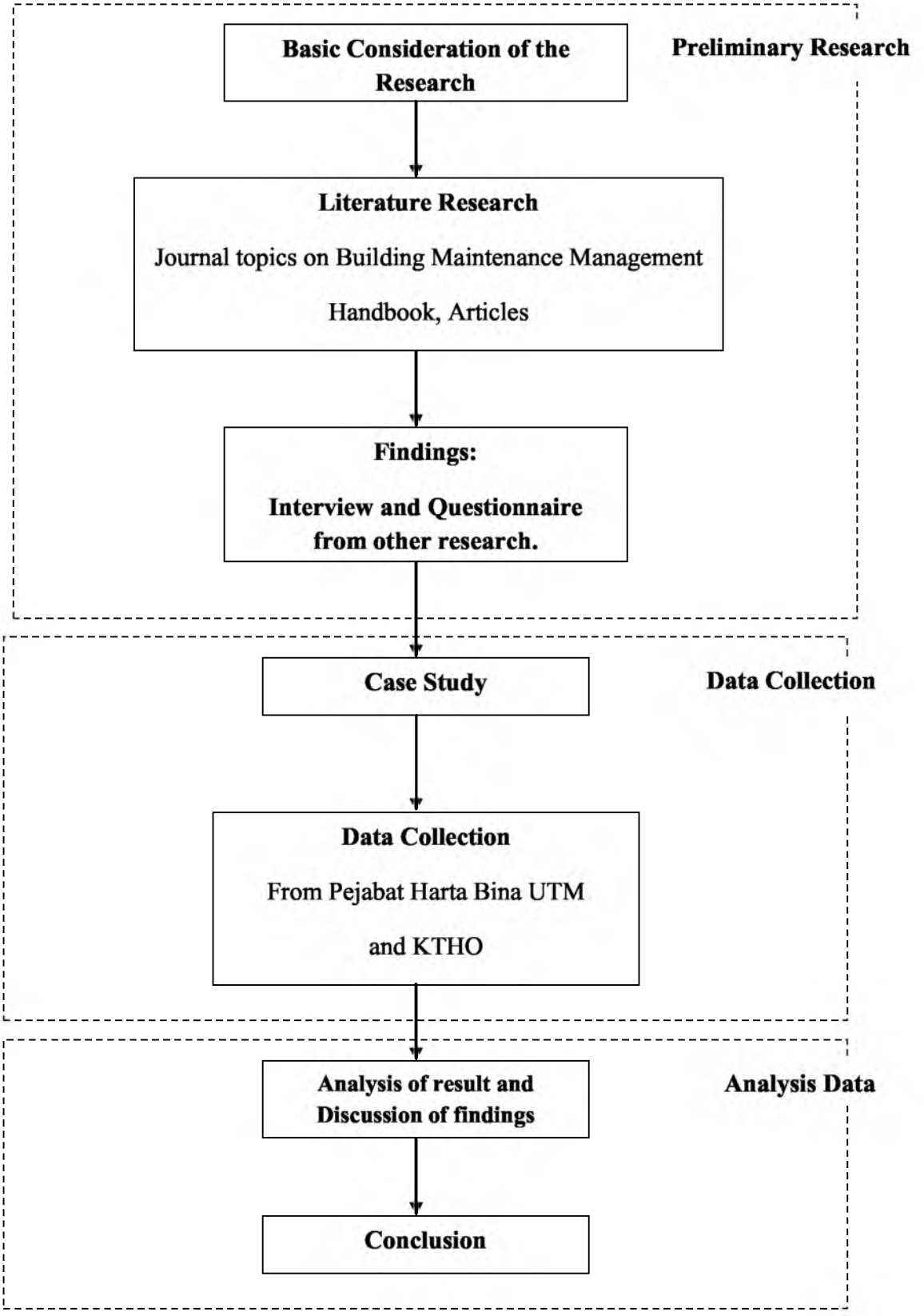
i. Based on the research, study and discussion on the topic of this stud, identify the problem statement for the topic and this is achievable through literature review on articles, journal, books, conference papers and others researchers' thesis.

ii. Primary information will be collected. This will be conducted through interviews, discussion, observation and investigation with others research on the topic with building maintenance management.

iii. Having collection all the information and data from the college and Pejabat Harta Bina UTM. The aim and objectives of this study are identified.

iv. Analysis on the data and primary information will be done so that the findings of this study can be concluded.

The following is the research methodology flow chart.



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